CSUS
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
Department of Computer Science
ECS 3018 Phone: 278-6834

C Sc 258 - Distributed Systems

Spring 1999

INSTRUCTOR: ***Isaac Ghansah***
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Office Hours: M 10-11a; T 10-1115a; W 645-730p; or by appointment

COURSE DESCRIPTION:

Coordination of decentralized autonomous computer systems connected by a communication sub-net to achieve a common goal. Topics include architectures, message-passing, remote procedure calls, deadlock detection, concurrency control, replication and error recovery, synchronization, resource management, distributed database systems, languages, distributed algorithms, software fault tolerance, design issues, and case studies.

Prerequisite: C Sc/CPE 175 and C Sc 205.

TEXTBOOK:

1. G. Coulouris and J. Dollimore, *Distributed Systems: Concepts and Design 2 ed*., 1994, Addison-Wesley.
2. I. Ghansah, *C Sc 258 Class Notes 1999 Ed.*
3. I. Ghansah, Readings on Distributed Systems (Papers), later ,

REFERENCES:

1) S. Mullender, *Distributed Systems, 2/E*, 1993, Addison Wesley/ACM Press.
2) J. Bloomer, *Power Programming with RPC,* 1991, O'Reilly and Assoc., Inc.
3) L. Zahn, *Network Computing Architecture,* 1990, Prentice Hall
4) T. Cassavant and M. Singhal, Readings in Distributed Computing *Systems* , 1994, IEEE Computer Society.
5) *Current Research Papers* from the professional literature.

GOALS:

1. To provide an introduction to concepts in distributed computer systems.
2. To obtain knowledge of important distributed processing applications, distributed control and distributed database systems.
3. To develop proficiency in access and use of the current literature in the area.

4. To learn how to design and implement RPC-based distributed applications involving the client/server model.

Prerequisites by Topic:

1. The ISO OSI 7-layer network model
2. Commonly-used network topologies
3. Fundamentals of operating systems
4. Data communications of the physical, data link, and network layers

GRADING POLICY:

Final	30%
Assignments	50%
Project	20%

Grading Breakdown (%):

A = 93-100	C = 73-76
A- = 90-92	C- = 70-72
B+ = 87-89	D+ = 67-69
B = 83-86	D = 63-66
B- = 80-82	D- = 60-62
C+ = 77-79	F = 59 or below

COURSE POLICIES:

1. Late assignment/project will be penalized by 20% if one lecture late. Nothing will be accepted if more than one lecture late.
2. Make-up exams will only be given under extreme circumstances. The instructor reserves the right to reject make-up requests.
3. Attendance will not be taken after first week of classes. However, you are responsible for material presented and announcements made in class.
4. Be aware of the school's policy on *drops, incomplete, and cheating.*

5**. Discussion among students in assignments and projects is part of the educational process and is encouraged. No discussion among students is allowed in any exams/quizzes. However, each student must make an effort to do his/her own work in all assignments and exams. No type of plagiarism will be tolerated except in the case of group work. In that case each student should indicate the part of the work which was his/her major responsibility in their final joint submission. Nevertheless, any work submitted is a contractual obligation that the work is the student's and for which he/she could be quizzed in detail. Any type of cheating which is brought to the attention of the instructor will be handled by the Dean of Students.**

C Sc 258 - TENTATIVE SCHEDULE

Week	SUBJECT MATTER	READING
1	Introduction, Architectural Models and Design Goals. Motivation. Types. Definition; Transparency; Examples; Client/Server Model; Advantages/Disadvantages. System Software Requirements. Services.	Chap. 1,2 & 6
2-4	Remote Procedure Calling (RPC). Characteristics; Implementation Steps; Locating Servers; Binding; RPC Semantics; Client/Server Crashes, Orphans; Examples: SUN RPC, HP/Apollo RPC, DCE RPC, Microsoft RPC.	Ch.5 & Bloomer
5	Single Server and Multiple Collaborating Server Design Issues.	
6	Time Service. Clock Synchronization algorithms: Cristian, Berkeley & Lamport Algorithms. Internet NTP. DCE DTS	Ch. 10
7	Directory/Name Service. Design Issues. Examples: Internet DNS, X.500, DCE CDS, Microsoft Active Directory	Ch. 9
8	File Service and Implementation Examples. NFS, AFS, DCE DFS	Chap. 8
9	Replication Service; Consistency; Update Protocols	Chap. 12, 13 & 14
10-11	Security. Secrecy: Encryption; Public and Secret Key Algorithms; Authentication Protocols; Authorization. Integrity. Non-repudiation: Digital Signatures. Trust: Key Management. Examples: Kerberos, PGP, PEM, DCE, Microsoft Windows NT Security.	Chap 16
12	Shared Data. Distributed Transactions. Crash Recovery; Concurrency Control. Non-Blocking Commit Protocols.	Ch 11
13	Advanced Topics as time permits. Distributed Programming Languages. Argus as an example of transaction-based distributed language. Distributed concurrency control. Fault Tolerance.	Class Notes; Ch.14; Ch 15
14-15	Project Presentations	

IMPORTANT DATES:

Spring BREAK: 3/29 - 4/2
FINAL EXAM SCHEDULE: M 5/24, 3-5pm